

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Survey
of
Greenwood County, South Carolina

By

F. R. LESH, in Charge
B. H. HENDRICKSON, A. H. HASTY, W. J. LATIMER
and **S. R. BACON**



Bureau of Chemistry and Soils

In cooperation with the
South Carolina Agricultural Experiment Station

BUREAU OF CHEMISTRY AND SOILS

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A. G. MCALL, *Chief, Soil Investigations*
SYDNEY FRISSELL, *Editor in Chief*

SOIL SURVEY

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W. E. HEARN, *Inspector, District 2*
J. W. MCKERICHER, *in Charge Map Drafting*

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H. W. BARRE, *Director*

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COUNTY SURVEYED

Greenwood County is in the northwestern part of South Carolina and comprises an area of 457 square miles, or 292,480 acres (fig 1). The fact that a large part of the boundary lines consists of rivers and creeks accounts in part for its very irregular shape. Greenwood, the county seat, is located approximately in the geographic center of the county and is about 80 miles northwest of Columbia, 58 miles south of Greenville, and 60 miles north of Augusta, Ga.

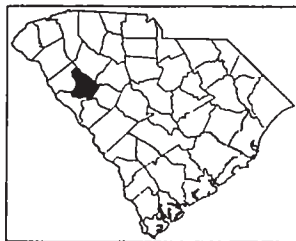


FIGURE 1 —Sketch map showing location of Greenwood County, S. C.

The county lies in the piedmont plateau, and the general surface relief comprises undulating, gently rolling, rolling, hilly, and broken areas. It is a plain which has been thoroughly and completely dissected by the numerous creeks and drainage channels that rise within or flow through it. A narrow continuous drainage divide parallels the Southern and the Piedmont & Northern Railways from Shoals Junction to Greenwood, thence it follows the general course of the Federal and State highways to the Greenwood-Saluda County line. The relief of this watershed ranges from undulating to rolling and becomes very rolling near the larger streams. This watershed is the source of perhaps 95 percent of the drainage of the county.

The areas of more broken relief occur along the entire northeastern side of the county, bordering Saluda River, and are drained by small tributaries of that river. West of Shoals Junction, Hodges, and Greenwood the country is rolling, in places very rolling, and is drained by feeder streams of Long Cane Creek which is for the most part in Abbeville County. The area north of Greenwood ranges from undulating to rolling or hilly. A wedge-shaped area south of Greenwood and Coronaca extends as far south as Verdery in the western part of the county and south and east of Ninety Six to the hilly belt along Saluda River. In surface relief this particular part of the county ranges from undulating to gently rolling, except where invaded by dissecting tributary drainage ways of Wilson, Ninety Six, and Hard Labor Creeks. The extreme southern part has gently rolling or rolling relief. The large streams have carved valleys from 100 to 250 feet below the general upland surface, and the small streams and creeks have cut valleys from 20 to 100 feet deep. The numerous intermittent drainage ways have cut back into the smoother and higher areas in the form of V-shaped gullies. Every farm in the county is connected with this drainage system and all the soils, with the exception of a few flat upland areas and the first bottoms, are naturally well drained.

Practically all the streams, except the small intermittent drainage ways which are actively cutting back into the higher ridges, are bordered by narrow strips of nearly level bottom land, which are subjected to overflow during seasons of heavy rainfall. The very few and inextensive areas of second-bottom land, or terraces, occur along Saluda River and along Cuffytown and Hard Labor Creeks. They lie above the present level of overflow waters. In places along Saluda River and the larger creeks, steep, badly eroded, and broken slopes extend to the water's edge and leave no space for first-bottom land. In a few places the larger streams have reached temporary base level, but most of them have sufficient fall to develop water power, as is evidenced by mills and gins built on their banks, which are operated by water power. Only a few of these are in use at present.

The highest elevation ¹ recorded in the county is 714 feet above sea level, in the vicinity of Hodges. The elevation is 671 feet at Greenwood, 400 feet along Saluda River near the Greenwood-Saluda County line, and 500 feet on Long Cane Creek, due west of Hodges. These elevations indicate the general lay of the land and the general southward and southeastward flow of the master drainage.

Greenwood County was organized from parts of Edgefield and Abbeville Counties in 1897. In 1917 a small part was taken from the southern part of Greenwood County to form part of McCormick County. Abbeville and Edgefield Counties were formed in 1793, from territory known as Ninety Six District which included a large part of northern South Carolina that was ceded by the Cherokee Indians to the white settlers in 1755.

The first settler, Robert Gowdey, established a trading post on the present site of the town of Ninety Six, and in this vicinity the first agriculture of the territory began. In 1756, Patrick and William Calhoun led a band of emigrants from Virginia and settled the territory west of Verdery and Bradley on the banks of Long Cane Creek. This settlement was made at a later date than that of Ninety Six and was not entirely within the present limits of Greenwood County. The immigrants who came in during the following years, or until the expulsion of the Indians from northern South Carolina in 1761, migrated from Pennsylvania, Maryland, Virginia, and North Carolina, or were refugees from the vicinity of Charleston during the Revolutionary War, and they were of English, German, and Scotch or Scotch-Irish descent. Several years after the expulsion of the Indians, a few French, from the French-Huguenot settlement west of Long Cane Creek, moved to the vicinities of the present sites of Verdery and Bradley. About 1800, the era of settlement largely terminated, with the exception of a few people who came in from the immediately adjacent territories. After Abbeville and Edgefield Counties were established, the population increased rapidly and was added to by the continual slow migration from nearby States.

The 1930 census ² reports the total population of Greenwood County as 36,078, of which 25,058 are classed as rural. Of the rural population 15,371 are classed as rural farm and 9,687 as rural nonfarm. Negroes make up 43.3 percent of the total population, and most of them live in the northern three fourths of the county. The rural

¹ Elevations obtained from Greenwood Chamber of Commerce.

² Soil survey reports are dated as of the year in which the field work was completed. Later census figures are given when possible.

inhabitants are well distributed, except in the northeastern part along Saluda River and in the extreme southern end. The density of the rural population is 53 persons a square mile.

Greenwood is the largest and most important town, with a population of 11,020 in 1930. It is an educational, manufacturing, and railroad center, three small junior colleges, several cotton mills of fair size, and other small industries, such as canning and packing plants, being within the limits of the town. Five railroads either have terminals at, or do a shipping business with, the county seat. Ware Shoals, with an estimated population of 4,000, and Ninety Six, an incorporated town with a population of 1,381, are the next important towns in size and industrial activity. Both have railway and highway facilities for transportation, and each boasts of several medium-sized cotton mills. The smaller towns include Cokesbury, Troy, Hodges, Coronaca, Verdery, Bradley, Epworth, and Kirksey, all of which have either railroad or Federal, State, or county highway transportation facilities. The cotton gins and gristmills in these smaller towns are adequate to meet their respective requirements.

The county is well provided with concrete, paved, and sand-clay surfaced and graded roads. Concrete highways traverse the county from Ware Shoals and Shoals Junction through Greenwood and, forking about 5 miles southeast of Greenwood, lead to Saluda and Edgefield. This is a Federal-aid project as well as a State project. One State highway, all except 7 miles of which is paved, and two sand-clay surfaced State roads traverse the county from east to west. Other State- and county-controlled, graded, improved, and well-kept roads serve nearly every section.

Branch and trunk lines of the Seaboard Air Line, Piedmont & Northern (electric), Charleston & Western Carolina, and Southern Railways, and a branch of the Georgia & Florida serve practically every town.

Rural telephone lines and mail routes are kept in good operating condition and reach practically all parts of the county, and rural consolidated schools and good church buildings are distributed in convenient locations. High schools are located at Ware Shoals, Ninety Six, and Greenwood.

Greenwood has two junior colleges for white pupils, a business college, one junior college for colored pupils, a Carnegie public library, churches of several denominations, a creamery, a cold-storage plant, two ice plants, a canning factory, an oil mill, a fertilizer plant, and an abattoir.

The chief industry centers around cotton. Five cotton mills at Greenwood and the large mills at Ninety Six and Ware Shoals operate 250,000 spindles. The privately owned gins are adequate to gin the cotton crop.³ Ninety Six and Greenwood have planing mills to take care of the timber that is sawed throughout the county. Brickyards are located at Godsey and at Dyson on the Southern Railway.

CLIMATE

The climate of Greenwood County is mild and healthful. The prevailing winds are from the west. The mean annual temperature is 61.6° F. Warm weather generally begins in May and lasts through September. The highest temperature recorded is 109°, which

³ An industrial survey of Greenwood, S C, made by the Lockwood-Greene Engineering Co furnished much of the information concerning the industries of the county.

occurred in July. However, summer temperatures above 100° are rare and of short duration. The average dates of the last and first killing frosts at Greenwood are March 23 and November 9, respectively, giving an average frost-free season of 231 days. Killing frost has been recorded as late as April 17 and as early as October 11.

The precipitation is well distributed throughout the growing season. Normally it is less in the spring than during the winter, this being favorable for planting crops. The largest amount of rainfall occurs during the summer, when it is most needed for the growing crops, and the lightest during the fall, when comparatively dry weather is essential for cotton picking and gathering other crops. Droughts are not frequent, the only serious droughts reported by the county farm agent occurring in 1904 and 1925.

The relief is such as to cause only slightly different climatic conditions in different sections, and the climate is in no way affected by the ocean or other large bodies of water. The winter temperature in the vicinity of Hodges is reported to be slightly lower than elsewhere, owing probably to the slightly higher elevation. Farm work can be carried on during the greater part of the winter, and wheat, oats, rape, clover, turnips, collards, and other crops can be successfully grown during that season. The ground freezes to only a slight depth, and cold spells are of short duration.

Table 1 gives the normal monthly, seasonal, and annual temperature and precipitation, as recorded by the United States Weather Bureau station at Greenwood, and may be considered representative of climatic conditions throughout the county.

TABLE 1—Normal monthly, seasonal, and annual temperature and precipitation at Greenwood, Greenwood County, S C
[Elevation, 671 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1925)	Total amount for the wettest year (1912)	Snow, average depth
	° F	° F	° F	Inches	Inches	Inches	Inches
December.....	43.6	76	11	4.35	2.41	2.26	0.5
January.....	42.9	76	4	4.01	9.54	5.14	7
February.....	46.3	80	-5	4.76	2.12	0.16	1.5
Winter.....	44.3	80	-5	13.12	14.07	13.56	2.7
March.....	52.9	89	16	4.12	2.16	7.77	1
April.....	61.2	96	28	2.97	1.47	4.30	(1)
May.....	70.4	102	38	3.74	1.21	3.57	0
Spring.....	61.5	102	16	10.83	4.84	15.64	1
June.....	77.6	105	42	5.28	.96	7.24	0
July.....	79.0	109	56	5.21	1.23	7.29	0
August.....	78.3	104	53	5.00	1.06	2.35	0
Summer.....	78.3	109	42	15.49	3.25	16.88	0
September.....	73.3	100	41	3.43	1.58	8.73	.0
October.....	62.0	99	22	2.83	3.03	4.24	0
November.....	51.9	82	19	2.66	3.42	3.03	.2
Fall.....	62.4	100	19	8.92	8.03	16.00	.2
Year.....	61.6	109	-5	48.36	30.19	62.08	3.0

¹Trace

AGRICULTURAL HISTORY AND STATISTICS

So far as reliable information is obtainable, the area including the present Greenwood County was at one time the hunting grounds of the Cherokee Indians. The Indians planted small fields of corn along the larger stream terraces and banks, and a large Indian town occupied the present site of Ninety Six. In the vicinity of that town the land was cleared and the rich dark-red soil was cultivated. For the greater part of their food, however, the Indians relied on wild game from the surrounding forests and fish from the nearby streams.

After the expulsion of the Indians in 1761, this same land became the scene of the first agricultural development of the territory, and, in fact, of the entire northern part of South Carolina. The principal crops grown by the early settlers were corn, oats, rye, wheat, and minor crops to supply food for the family and feed for the hogs, sheep, cattle, and work animals. At a later date, indigo, tobacco, flax, and cotton were grown and were marketed at Charleston. This practice, however, did not flourish on account of the long hazardous journey by oxcart through Indian-infested country and over mere trails blazed through the forest. After better roads had been built and the hostile Indians exterminated, many cattle and horses were raised on the bottom-land pastures and were driven to the markets of Charleston. Horse raising flourished, and the high quality of the Carolina horses was known far and near. In the period between the Revolutionary War and the Civil War, agricultural development increased with rapid strides.

After settlement began, about 1760, tobacco was produced, packed in casks, and rolled to the Charleston markets. Indigo was also among the first commercial agricultural products, but it gave way to keener competition by foreign countries. Cotton was introduced about 1800, but the increase in its production was gradual until the cotton gin came into practical use and the country was afforded railroad transportation. From 1850 to 1860 the average farm in this vicinity was a combination cotton, grain, and livestock farm and produced an abundance of products, from all or any one of the three sources, to put on the markets. Since that time cotton has been grown, almost to the exclusion of other crops.

TABLE 2 — *Acreage and yield of the principal crops in Greenwood County, S C, in stated years*

Crop	1899		1909		1919		1929	
	<i>Acres</i>	<i>Bushels</i>	<i>Acres</i>	<i>Bushels</i>	<i>Acres</i>	<i>Bushels</i>	<i>Acres</i>	<i>Bushels</i>
Corn.....	32, 616	278, 720	31, 062	377, 407	29, 542	405, 387	20, 505	230, 750
Oats.....	11, 091	106, 610	12, 108	176, 286	4, 238	73, 850	3, 480	61, 204
Wheat.....	5, 158	33, 630	649	5, 365	808	6, 789	1, 655	13, 036
Dry peas.....	474	3, 992	1, 187	5, 485	406	2, 484	540	11, 911
Potatoes.....	81	3, 889	112	9, 649	264	19, 918	121	8, 196
Sweetpotatoes.....	570	35, 590	770	67, 095	889	74, 285	485	35, 841
		<i>Tons</i>		<i>Tons</i>		<i>Tons</i>		<i>Tons</i>
Hay and forage.....	3, 276	3, 328	7, 450	6, 735	7, 211	6, 855	1, 885	1, 609
		<i>Bales</i>		<i>Bales</i>		<i>Bales</i>		<i>Bales</i>
Cotton.....	70, 601	21, 888	77, 295	30, 291	70, 102	30, 910	40, 740	15, 725
		<i>Trees</i>		<i>Trees</i>		<i>Trees</i>		<i>Trees</i>
Apples.....	16, 124	5, 294	10, 539	4, 979	6, 544	1, 173	3, 746	2, 602
Peaches.....	28, 306	1, 805	30, 128	17, 081	24, 636	4, 255	15, 087	5, 719
		<i>Pounds</i>		<i>Pounds</i>		<i>Pounds</i>		<i>Pounds</i>
Grapes.....	12, 538	85, 371	5, 698	29, 682	2, 278	12, 850	3, 606	38, 241

¹ In addition to corn harvested for grain, that from 202 acres was cut for silage, from 886 acres was cut for fodder, and from 322 acres was hogged off

² Hay only

Table 2, compiled from statistics of agriculture from the United States census reports, indicates the general trend of crop production during the last 40 years.

The census figures readily indicate the order of importance in the acreage devoted to the different crops. The stability in the number of acres devoted to several crops each year is striking. There has been a marked decrease in the acreage of wheat, oats, and hay. In 1929, cotton, corn, oats, and hay were the leading crops, ranking in order of their acreage.

Until 1920, cotton was, by virtue of the existing natural and economic conditions, the logical cash crop to grow in order to farm successfully. Small grains, hay, and forage, and the minor crops, such as garden crops for home use, truck crops, and fruits, were grown largely to meet the demands of home consumption on the farm. After the advent of the cotton bollweevil in 1920, this crop gradually became less profitable. According to the 1925 and 1930 census reports, the cotton acreage decreased almost one half in 5 years, but it has shown a slight increase in the last 5 years. Corn has been the only crop that has not suffered a decided decrease in acreage and yields. The acreage of land used for oats has decreased until it is only about one fourth of that in 1900, and the hay and forage acreage has greatly decreased.

The land value of farms decreased from \$58.87 in 1920 to \$18.91 an acre in 1930. According to the 1930 census, 26.8 percent of the farms are operated by owners or part owners, 72.6 percent by tenants, and 0.6 percent by managers. The average size of farms is 73.1 acres, of which nearly 39 acres are classed as crop land and plowable pasture. The number of farms decreased from 4,005 in 1920 to 3,084 in 1930, which indicates considerable abandonment of farm lands, due, for the most part, to the fact that cotton, heretofore the most profitable crop, has become infested with an insect pest, and yields and prices of cotton are reduced.

The fact that the soil and the climate are adapted to several other important crops, to new cropping systems, and to new agricultural industries, is the redeeming feature in the present state of agricultural depression of the cotton grower. Corn, oats, wheat, rye, hay, and legumes will grow as well as cotton and may be converted into beef, pork, and other livestock and their products, provided a market can be developed for them.

In 1929, nearly 10,000 tons of commercial fertilizer of a 4:10:2⁴ mixture were bought at \$28 a ton to be used on approximately 103,234 acres of cotton, corn, and oats. A proportionate tonnage of nitrate of soda was bought that year at about \$48 a ton, as only a very few farmers plow under legumes or green manures as soil amendments. The cotton crop for the year 1928 was valued at \$1,272,809 for lint and \$183,931 for seed. The corn and oat crops were valued that year at \$399,718 and \$157,736, respectively.⁵

Very few farms, except those which have been foreclosed for indebtedness, have changed hands recently.

On the owner-operated farm, the farmer and his family do most of the work and hire extra help by the day when necessary. On the tenant-operated farms, the share-crop system is used almost entirely,

⁴ Percentages, respectively, of nitrogen, phosphoric acid, and potash.

⁵ Statements of the county farm agent.

very little rent being paid in cash. The majority of the farm tenants are Negroes. In the customary system of share cropping, the owner furnishes the land, the work animals, and one half of the fertilizer, and he receives one half of the crops. This is the plan most commonly practiced and the most desirable for the landlord, as it allows him to exercise more control over the management of his land. Another system is used wherein the tenant furnishes the work animals and one half of the fertilizer and receives two thirds of the cotton and three fourths of the corn. The terms of tenancy depend on how much the owner furnishes in the way of seed, fertilizer, and work animals, and whether or not he insures his tenant a season's food supply.

The customary set of farm buildings on tenant farms consists of a 1-story dwelling, a small barn in which to keep a part of the feed for the livestock and to house work animals and, perhaps, a cow, and a shed in which to store machinery or an automobile. Very few farm buildings have received paint or repairs in recent years. On many farms the crops, as well as the farm implements, have no better shelter than a tree in the barnyard. Some 2-story well-painted houses and fair-sized barns with out houses and sheds are scattered over the county.

The tenant farmer usually works with 1-horse implements, including a plow, a stalk cutter, a spike- or spring-tooth harrow, a fertilizer drill or guano horn, and a cotton planter. He cultivates the cotton and corn crops with a 1-horse plow with sweeps, shovels, half shovels, or bull tongues. The better farmers and owner operators may use disk harrows, mowing machines, and hayrakes. A very few have riding cultivators, and some have threshing machines, tractors, grain binders, and Martin ditchers for constructing terraces.

SOILS AND CROPS

The soils and agriculture of Greenwood County are essentially similar to those of the piedmont plateau in this general soil region. About three fourths of the county has undulating, gently rolling, or rolling surface relief, and all of it, except the first-bottom areas and a few small areas of flat upland, is naturally well drained.

Several distinct rock formations give rise to several groups of soils which are readily recognized by the farmers and landowners. The underlying rock formations differ in their chemical and physical properties, and these differences are in many places revealed in the character of the surface soil and subsoil, and very distinctly in the agriculture of different parts of the county. The soils derived from granite are markedly distinct in all their characteristics from the soils derived from the dark-colored basic rocks, or so-called "niggerheads", and they also differ from the soils derived from the fine-grained slate rocks in the extreme southern end of the county. The nitrogen content in most of the soils is practically the same, that is, it is generally low. The content of potash is greater in the soils derived from granites and gneisses than in the soils derived from other formations.

By far the greater part of the soils of Greenwood County have, at one time or another, been under cultivation. Some of the areas having the smoother relief occur to the north and east of Greenwood. On the interstream divide between Greenwood and Ninety Six is an area of comparatively smooth country, and the soils are dominantly red clay loams, mainly Davidson clay loam. This section has been termed "the grain belt of Greenwood County."

The southernmost part of the county, or practically one seventh of the total area, lies in the slate belt. In this locality, a large part of the land was at one time under cultivation, but the greater part of it has been abandoned in recent years, or since the advent of the cotton bollweevil.

Approximately 25 percent of Greenwood County comprises first-bottom land, broken phases of the clay loam soils, and Wilkes sandy loam. All these areas, under present economic conditions, are unsuited for general-farming purposes. The first-bottom areas are subject to overflow, and the broken areas, comprising rough gullied land, are too rugged for cultivation.

The original tree growth consisted largely of several varieties of oaks, as white, post, red, black, blackjack, and water oaks, in addition to hickory, chestnut, walnut, elm, cedar, locust, poplar, yellow poplar, and a few other trees of the deciduous hardwood class. Where the soil had a higher moisture content, willow, cedar, beech, birch, poplar, ash, black gum, sweetgum, and a few sycamore and dogwood trees constituted the virgin forest cover. A very few shortleaf pines grew among the deciduous trees of the better-drained upland and the less well drained slopes and bottoms. The smaller plant growth on the floor of the virgin forest consisted of a legume (probably wild pea vine), wild strawberry, and cane.⁶

Practically all the merchantable timber has been cut, the greater part having been removed from 60 to 100 years ago, and a second growth of old-field pine, some oaks, sweetgum, and hickory now covers the rough and more broken areas and some of the abandoned farms.

Erosion has played an important role in the destruction of approximately 12 percent of the soils of Greenwood County. Some areas of the once most fertile land have been ruined by washing and gullyng, and these have caused the abandonment of many farms.

The most thickly populated part and perhaps the most intensely cultivated land is in certain localities in the northern three fourths of the county. The choicest and most profitable farm land today is that which has a favorable surface relief, good physical characteristics, good drainage, and soils on which cotton will mature quickest under bollweevil conditions.

Cotton is the dominant crop considered as to acreage and cash value, corn ranks second in importance, the oat crop is third, and the next important crop is hay. The corn, oat, and hay crops are consumed on the farms on which they are grown and on many farms are not sufficient to meet the demands of the farm livestock. With the exception of the broken land, the first-bottom land and, to a certain extent the soils of the southernmost part of the county, all four of the major crops mentioned are grown on nearly every farm, irrespective of the type of soil. Throughout the county the yields of subsistence crops are low on many of the soils on which they are grown. However, the better farmers are able to fertilize, manure, and manage their soils so as to obtain good yields from all the crops grown.

Cotton is by far the most important cash crop, because it finds ready sale at all times, it may be easily stored at a low cost, and it is the one crop grown in this part of the country on which credit can be obtained.

⁶ RAMSAY, D. HISTORY OF SOUTH CAROLINA FROM ITS FIRST SETTLEMENT IN 1670 TO THE YEAR 1808. 2 v., Charleston 1809

It is grown wherever a profitable yield is obtainable, regardless of the type of soil. The present low financial status of the cotton grower is such that he is often compelled to either sell his produce for cash or be able to obtain credit. It is a crop which cannot be entirely handled by machinery, as corn or oats may be, and in the Cotton Belt cheap labor is available to do this work. The climate is favorable for the growth of the cotton plant which does not require an especially fertile soil but one that will retain moisture and such plant-food elements as are applied in the way of commercial fertilizers and manures. The fact that the present-day cotton grower and his laborers have descended from many generations of cotton growers, dating back to the time of the perfection of the cotton gin which made the production of cotton a profitable enterprise, is not to be overlooked.

The minor crops grown are the results of soil differences and economic needs.

The soils of Greenwood County, based on their color, texture, structure, and drainage, as well as on a crop-producing basis, can be placed in four groups as follows: (1) Soils with light-gray sandy surface soils, (2) soils with red clay loam surface soils, (3) soils with gray or brown loam surface soils, and (4) soils with gray or pale-red silt loam surface soils

In the following pages of this report the soils of Greenwood County are described in detail, and their agricultural relationships are discussed, their location and distribution are shown on the accompanying soil map; and their acreage and proportionate extent are given in table 3.

TABLE 3—Acreage and proportionate extent of the soils mapped in Greenwood County, S C

Type of soil	Acre	Percent	Type of soil	Acre	Percent
Cecil sandy loam.....	11, 776	4. 0	Davidson clay loam, broken phase.....	1, 088	0. 4
Cecil sandy loam, mixed phase.....	30, 720	10. 5	Iredell loam.....	11, 392	3. 9
Cecil fine sandy loam.....	8, 000	2. 7	Mecklenburg loam.....	9, 920	3. 4
Appling sandy loam.....	9, 152	3. 1	Mecklenburg loam, broken phase.....	1, 152	. 4
Appling coarse sandy loam.....	2, 044	1. 0	Wickham fine sandy loam.....	320	1
Durham coarse sandy loam.....	1, 984	7	Meadow (Congaree material).....	23, 488	8. 0
Worsham sandy loam.....	640	2	Georgeville silt loam.....	10, 944	3. 8
Wilkes sandy loam.....	32, 320	11. 1	Georgeville silty clay loam.....	13, 824	4. 7
Cecil clay loam.....	59, 968	20. 5	Alamance silt loam.....	8, 448	2. 9
Cecil clay loam, broken phase.....	19, 328	6. 6	Orange silt loam.....	13, 504	4. 6
Davidson clay loam.....	21, 568	7. 4	Total.....	292, 480	-----

SOILS WITH LIGHT-GRAY SANDY SURFACE SOILS

This group includes Cecil sandy loam; Cecil sandy loam, mixed phase; Cecil fine sandy loam; and all the types of the Durham, Appling, Wilkes, and Worsham series mapped. These soils, locally called "white sandy lands", have light-gray sandy surface soils and subsoils of stiff but brittle and friable clay that is variable in color, being entirely gray, entirely yellow, red or yellowish red, or a mingled or banded red, yellow, and gray combination of colors. These soils occupy approximately one third of the entire area of the county. With the exception of the broken lands occupied by the Wilkes soils, all of them occur as undulating, slightly rolling, rolling, or sloping areas, which lie well for agricultural purposes and have excellent sur-

face and subsoil drainage They occur in large areas and might easily be handled with tractor power and improved machinery. They are easy to till, and light farm implements meet the need for most crops. The Wilkes soil occurs on very rolling, hilly, or steep relief of badly eroded and broken character. The soils of this group, as a whole, are most extensive to the north, east, and west of Greenwood

The sandy character of the surface soils, which range in texture from coarse sandy loam to fine sandy loam, allows the absorption of considerable rainfall and at the same time allows rapid drainage and consequent early warming up of the soils in the spring The favorable structure of the subsoils makes them retentive of large amounts of moisture. Organic matter and plant-food elements are very low in these soils, owing largely to their sandy texture and thoroughly leached condition. The mellowness, the friability, the ease with which they are handled, the early date at which crops may be planted, and the response of the soils to commercial fertilizers are desirable characteristics These desirable qualities make them the most prized cotton lands under bollweevil conditions, and the most profitable crop-producing soils. Corn, oats, and forage crops are grown for home consumption to less extent, and yields are low, owing to the light, sandy character, deficiency of organic matter, and low content of plant-food elements of the soils By the use of manures and fertilizers these soils can be made to produce the most profitable crops of the county. The fact that they are lacking in plant-food elements is evidenced by the increased yields obtained from all crops when legumes or green manures are plowed under or large amounts of commercial fertilizer are applied.

Although the degree of acidity is not a highly important factor in the production of such crops as are commonly grown on the soils of this group, it becomes a matter of concern when the growing of legumes is attempted. It has been proved by field tests⁷ that the sandy loam soils of the Cecil, Appling, and Wilkes series within this group are moderately acid, and that Cecil fine sandy loam, Appling coarse sandy loam, and Durham coarse sandy loam are highly acid in their surface layers.

On the surface and mixed with Cecil sandy loam, Cecil sandy loam, mixed phase, and Cecil fine sandy loam are small areas of gravel consisting largely of quartz fragments which range from one half inch to 5 inches in diameter. Where gravel occurs in sufficient quantities and in large enough areas to be shown, it is located on the soil map by gravel symbols, but numerous small areas of gravelly soils a few square feet in extent occur throughout these Cecil soils, and they are not indicated on the soil map In no place does the gravel content of the surface layer greatly hinder cultivation.

The physical characteristics of these soils and their responses to fertilizers render them desirable for the production of cotton, peanuts, bright tobacco, sorgo, sweetpotatoes, garden vegetables, turnips, rape, watermelons, cantaloups, scuppernong grapes, and various fruits, as well as for the staple crops. Cotton matures earlier on these soils than on the clay loams, and this is a great advantage under bollweevil conditions. These soils can be cultivated earlier in the spring and sooner after rains than the heavier soils.

⁷ Acidity determined by use of LaMotte Teskit Duplex Solution made in the field

Cecil sandy loam.—Cecil sandy loam, together with its mixed phase, is the most extensive soil of this group. It covers a total area of 66 4 square miles. This soil occurs on the comparatively smooth inter-stream areas or divides in the northern two thirds or one half of the county, east, southeast, and northeast of Greenwood. Small scattered bodies occur throughout the remaining parts, with the exception of the slate belt.

The surface soil of Cecil sandy loam, to a depth ranging from 6 to 9 inches, is light grayish-brown or brownish-yellow light sandy loam or loamy sand. In most places, a 1- to 3-inch layer of yellowish-red heavy sandy loam or sandy clay occurs between the surface soil and the subsoil. The subsoil is red stiff brittle clay extending to a depth ranging from 36 to 48 inches. The clay is hard and breaks into irregular-shaped lumps when dry, but it is sticky when wet. It is permeable to air and water, and plant roots have no difficulty in penetrating it. Below this clay is yellowish-red friable clay containing a noticeable quantity of small mica scales. This layer differs greatly in thickness from place to place, and it is underlain by the soft light-colored granite or gneiss rock.

In large smooth areas, the surface soil contains a noticeably larger quantity of fine material. Where the relief is sharper, the proportion of coarse material increases, and, in narrow strips or ridges and on some slopes, much coarse sand occurs on the surface. At the bases of slopes, the light sandy surface layer may range in depth from 12 to 15 inches, and in some places the clay subsoil is only 12 or 14 inches thick overlying the rock. Scattered indiscriminately and localized in spots is a small percentage of small angular white or brown quartz gravel, together with a few fragments of quartz rock. Such areas are shown on the map by gravel symbols.

Cecil sandy loam warms up quickly in the spring and can be cultivated soon after rains. It is considered the earliest soil in the county, owing to its sandy texture, mellow structure, and good drainage throughout.

Probably about 90 percent of the land is in cultivation, about 60 percent of which is devoted to cotton, about 20 percent to corn, about 10 percent to oats, and the rest to sweetpotatoes, vetch, fruit, pecans, and home gardens.

With an application ranging from 300 to 400 pounds of a 4 : 10 : 2 or 4 : 10 : 4 commercial fertilizer, cotton normally yields from one half to three fifths bale an acre, under existing bollweevil conditions.⁸ Corn in general is not fertilized, but it receives a side dressing ranging from 75 to 100 pounds of nitrate of soda an acre. It yields from 15 to 20 bushels an acre. Oats are given an acre application of about 200 pounds of superphosphate (acid phosphate) at time of sowing and in the spring a top dressing ranging from 75 to 100 pounds of nitrate of soda. Most of the oats are fed in the sheaf, but those threshed for grain yield from 25 to 30 bushels an acre. Another method of harvesting the oats crop is to cut it while green and cure it for hay. The growing of vetch and oats together for hay is becoming popular among the better farmers of the county. Very few farmers turn under legumes or green manures to enrich the soil. Such treatment would be very beneficial to the soil and would increase crop yields. The rotation most commonly practiced on this soil is corn 1 year, cotton 2

⁸ Crop yields in this report and amounts and kinds of fertilizers applied have been verified by the county arm agent.

years, and oats 1 year. However, the oats and corn acreages are never large enough to cover all the land occupied by cotton each year.

Cecil sandy loam is considered one of the best soils in the county for the production of cotton, and the early date at which this soil may be worked is very important. In normal seasons a fair crop is usually obtained before the bollweevil becomes destructive. This is also a desirable soil for growing truck crops, pecans, orchard fruits, and berries. As part of the land has an undulating or sloping surface relief, it is highly important that this soil be kept well terraced, in order to avoid washing away of the sandy surface layers during heavy rains. The terraces may be so constructed as to allow the use of tractors and other improved farm machinery.

Cecil sandy loam, mixed phase.—This soil differs from typical Cecil sandy loam mainly in the variability of the depth of the sandy loam surface covering which overlies the red clay subsoil. The subsoil is identical with that of the typical soil. Plowed fields present a spotted appearance, wherein areas of light-gray sandy loam surface soil predominate, and numerous small areas of reddish-brown or pale-red sandy clay or clay occur also. The sandy surface covering may be deep enough to cover the greater part of the underlying clay when the soil is undisturbed, but when the land is plowed, the red subsurface material is turned up. These shallow or eroded areas are too small and too numerous to be indicated on the soil map.

The surface relief of this soil is slightly more undulating and more sloping than that of the typical soil, consequently surface drainage is more thorough. This condition has resulted in considerable erosion, and terracing is therefore more necessary than on the typical sandy loam. In fact, Cecil sandy loam, mixed phase, is the result of erosion and washing off in spots of the sandy surface layer of Cecil sandy loam. The exposed clay or sandy clay areas are not handled with the same ease as is the typical sandy loam. Drainage is less rapid, and consequently warming up of the clay and sandy clay exposures is slower in the spring than on the typical soil, and where many of these spots occur, the date at which the land may be planted is a few days later than is true of the typical soil.

The yields of the various crops grown on this soil are only slightly lower than on typical Cecil sandy loam, but otherwise the two soils are very similar. The land is used as extensively for cultivated crops as is the typical soil. It is planted to the same crops in practically the same proportionate acreages and is fertilized in much the same manner.

High well-kept terraces are very important on this type of land, in order to prevent further erosion and consequent increase in size of the areas of the exposed subsurface clay layers. The soil occurs in rather large areas or in very close association with Cecil sandy loam, and the use of tractors as motive power and of improved farm implements is possible and feasible.

Cecil fine sandy loam.—The surface soil of Cecil fine sandy loam is light yellowish-brown or grayish-brown mellow fine sandy loam or very fine sandy loam. The surface layer ranges from 4 to 8 inches in thickness, depending on the amount of surface washing to which it has been subjected. In many places small flat fragments of gray or light-brown rock are strewn over the surface. A 4- to 6-inch layer of reddish-yellow heavy fine sandy loam underlies the surface soil.

The subsoil is stiff but brittle and friable red clay which has a distinctly smooth feel and contains numerous small shiny yellow mica scales. At a depth ranging from 24 to 48 inches, light-red stiff heavy silty clay is present. Below this depth a mixed red, yellow, and gray decayed mass of fine-grained rock occurs, which is very slick to the feel and contains a high percentage of mica. Field tests indicate that the surface, subsurface, and subsoil layers are higher in acidity than the corresponding layers of Cecil sandy loam.

Cecil fine sandy loam is not so extensive as the other Cecil soils, its total area being only 12.5 square miles. Some fairly large areas lie west of Hodges and close to the Abbeville-Greenwood County line. The greater part of this soil borders the northern edge of the slate soils.

Perhaps 50 percent of Cecil fine sandy loam is cultivated, the principal crops being cotton, oats, corn, and hay. Cotton is grown on about one half of the tilled land, and oats occupy about 30 percent and corn about 20 percent of the other half. Vetch and oats are grown together and harvested while green for hay. This practice is increasing in favor on this soil. Some of the uncultivated land is reverting to pine, scrub oaks, sedges, and wild grasses, some of which are pastured. The yields of the various crops, the fertilizer treatment, and the methods of cultivation are very similar to those on Cecil sandy loam. The fine texture of the surface soil does not allow such rapid drainage as on the more sandy and coarser-textured soils, and the land does not drain so quickly or warm up quite so early.

Appling sandy loam.—To a depth of 4 or 6 inches the surface soil of Appling sandy loam is mellow friable light-gray sandy loam or loamy sand. It is underlain by a layer ranging from 6 to 10 inches in thickness, which in the upper part is yellow sandy loam. This material grades into salmon-colored or orange sandy clay. The subsoil is reddish-yellow stiff but brittle and moderately friable clay ranging from 10 to 15 inches in thickness. Below this is light-red and yellow banded or streaked friable clay which extends to a depth ranging from 38 to 42 inches. This material grades into yellowish-red or pink, yellow, and light-gray soft friable disintegrated rock.

Included with this soil as mapped are areas of Appling fine sandy loam, which are too inextensive to be mapped separately. Most of these small areas occur along a road extending west from a point midway between Downs and Irving on the Piedmont & Northern Railway to the western county line. Small areas of Wilkes soils and small bodies of Cecil and Durham soils are also included.

Appling sandy loam is inextensive, its total area being 14.3 square miles, of which as much as 80 percent is farmed to cultivated crops. The largest development of this soil occurs in the northern part of the county as a belt extending in an east-west direction and including the towns of Hodges and Cokesbury. Several areas are in the vicinity and west of Greenwood. Smaller areas are in the vicinity of Ninety Six and southeast and southwest of Greenwood.

Cotton, corn, and oats are the principal crops, and vetch and oats, grown together for hay, occupy a rather large acreage. About 60 percent of the tilled land is devoted to cotton which yields from one half to three fifths bale an acre, 20 percent is planted to corn, and 10 percent to oats. The corn and oats yields are very similar to those obtained on the Cecil soils of this group. The kinds and amounts of

commercial fertilizer applied to the various crops and the methods of handling this soil are very similar to those used on Cecil sandy loam. Sweetpotatoes may be profitably grown for market, and fruit trees produce sufficient fruit for home use. Bright tobacco can be grown on this soil. Under the existing bollweevil conditions this is one of the highest-yielding cotton soils in the county.

Appling coarse sandy loam.—Only in a few minor respects does Appling coarse sandy loam differ from Appling sandy loam. The surface layer is light-gray or gray loamy coarse sand which is underlain by light-yellow or light-brown loamy coarse sand. The subsoil differs principally from that of the sandy loam in being a coarser sandy clay which is slightly more brittle and crumbly than the subsoil of Appling sandy loam.

This soil occurs in comparatively small scattered areas, most of which are contiguous to, or in the vicinity of, Appling sandy loam. Its extent is approximately one third that of Appling sandy loam. Perhaps 90 percent of the land is cultivated. The crops, yields, methods of handling the soil, and fertilizer treatments used are practically the same as those on Appling sandy loam. This soil is slightly more open and porous and is subject to more leaching than the fine-textured soils.

Durham coarse sandy loam.—The general surface appearance of a field of Durham coarse sandy loam is very similar to that of the Appling soils, except that the Appling soils have a slight yellow tinge whereas the Durham soil is very light gray or white. Durham coarse sandy loam occurs mainly in close association with the Appling soils.

The surface soil is light-gray or pale yellowish-gray loamy coarse sand or coarse light sandy loam, from 5 to 7 inches thick, and it contains some very coarse sand grains and small angular quartz gravel. It is underlain by a pale-yellow loamy coarse sand layer ranging from 12 to 16 inches in thickness. The subsoil is yellow friable coarse sandy clay to a depth ranging from 20 to 30 inches. It grades into yellow, mottled with light gray, hard but brittle clay containing also a few reddish-brown mottlings. Below a depth ranging from 50 to 60 inches is blotched or spotted pink, purplish-red, red, yellow, and light-gray hard but brittle clay.

This is an inextensive soil, and practically all the land is under cultivation. It occurs in close association with the Appling soils, and the surface relief is almost flat or undulating. The crops grown, yields, and fertilizer treatments are similar to those on Appling coarse sandy loam. This is considered one of the best soils in the piedmont plateau section of North Carolina for the production of bright lemon-leaf tobacco. Sweetpotatoes, sorgo, and garden vegetables do well.

Worsham sandy loam.—Worsham sandy loam occurs mainly within areas of Appling and Durham soils. It is of minor importance owing to its small extent. The surface soil is gray or dark-gray sandy loam from 4 to 8 inches thick, and it is underlain by 10 or 12 inches of gray or light-drab sandy loam which contains very little clay, silt, or very fine sand particles. The subsoil is variable in color. Beginning at a depth of 18 or 20 inches it is gray, very light gray, or almost white sandy clay or clay with yellow, light-brown, and blue mottlings. Locally the white clay subsoil is used for whitewashing fireplaces in the homes.

This soil occurs in small scattered areas, ranging from 1 to 5 acres in extent, within areas of the Appling and Durham soils, at the heads of or along small indistinct drainage ways, or in places as narrow strips at the bases of Cecil soil slopes bordering the first bottoms. The surface relief is nearly flat or undulating, and the land slopes gently toward the small streams. This soil is poorly drained, seepy, and contains wet-weather springs. On account of its poorly drained condition it supports an excellent growth of tame grasses throughout the drier summer months, and it is used almost exclusively for grazing.

Wilkes sandy loam.—Wilkes sandy loam represents a condition of soil materials and rock formations rather than a typical soil. With the exception of a few fairly smooth areas, all of Wilkes sandy loam has broken, strongly rolling, or hilly relief. Its largest development is in the northern part of the county. It is also developed on the steep slopes lying between the uplands and the first bottoms along Hard Labor, Cuffytown, Beaverdam, Curltail, and a few other creeks. The smoother parts, or a very few local areas which occur north and east of Greenwood, would have been mapped as Helena sandy loam had they occurred in sufficiently large areas. Such areas have a gray sandy loam surface soil passing into pale-yellow or light-brown mellow sandy loam extending to a depth of 6 or 8 inches. This material is underlain by mottled yellow, red, brown, and gray plastic sticky clay which in some places is brownish-yellow waxy clay having somewhat the characteristics of the Iredell subsoil.

Most of Wilkes sandy loam is so variable in color, depth of soil, and character of subsoil, and the disintegrated rock is so near its surface that no definite description will fit it. It includes spots of Durham, Appling, Cecil, Iredell, and Mecklenburg soils too small to be separated as individual soil types.

Perhaps 10 percent of the smoother land is used in the production of corn and oats, and some is used for pasture. In the rolling, more hilly parts of this soil only a few patches here and there are cultivated. Before erosion was so active a large part of the land was under cultivation, but now the abandoned and gullied hillsides are being reforested with blackjack oak, some pine, dogwood, and cedar. With the exception of the smoother spots, Wilkes sandy loam is really unfit for general farming, as it is subject to continued erosion and is too uneven in surface relief to be economically handled. The best use for this soil is forestry.

SOILS WITH RED CLAY LOAM SURFACE SOILS

This soil group includes Cecil clay loam; Cecil clay loam, broken phase; Davidson clay loam; and Davidson clay loam, broken phase. These soils are commonly known as "red lands" or "red clay lands" by the inhabitants, and they are more or less evenly distributed over the northern three fourths of the county.

The surface soils are red or reddish-brown clay loams, and the subsoils are red or dark-red stiff but brittle clays. All the members of this soil group, owing to the undulating, gently rolling, or broken surface relief, have good or almost excessive surface drainage. The internal or subsoil drainage ranges from fair to good. Owing to the moderate degree of friability of the subsoil strata, air and water have

penetrated, and a high state of oxidation has resulted, as is evidenced by the predominance of the red color in the subsoils. However, on account of their clay or clay loam surface soils, these soils do not absorb rainfall so readily as soils with sandy loam surface soils. But when the winter rain has penetrated these heavy clay loam surface soils and clay subsoils it drains away slowly, thereby retarding the time at which the soils dry and warm up in the spring and delaying the time of planting. Cotton planted on such soils at a later date matures more slowly than on the more sandy soils, and the fruiting of the cotton plant is delayed to such an extent that much of the late-maturing cotton is destroyed by the bollweevil.

In order to handle these heavy soils efficiently, strong work animals and heavy farm machinery are necessary. Inherently these are the strongest upland soils of the county, and they may be built up to a high state of productivity and maintained in this condition by plowing under barnyard manure or leguminous crops. The clayey character of the surface soil, subsurface soil, and subsoil insures the retention of such parts of the plant-food elements supplied by manure and commercial fertilizers as are not readily assimilated by the growing crops.

The occurrence of gravel or rock fragments of white quartz, granite, and black diorite rock, ranging in size from one half inch to several inches, is not uncommon on the surface of Davidson clay loam and Cecil clay loam. On many of the ridges and knolls sufficient gravel occurs to warrant indication by symbol on the soil map. The gravelly areas are not extensive, and no doubt many exist that are not indicated. In no place is the gravel sufficient to hinder cultivation to an appreciable extent.

The soils of the red-land group cover an area of 159.3 square miles. They constitute the most extensive soil group of the county, but, in proportion to their extent, a relatively much smaller acreage of these soils is devoted to cultivated crops than of the sandy soils. Since the advent of the cotton bollweevil a decade ago, the acreage devoted to cotton on these soils has been greatly reduced. The cotton plant can produce a larger crop on the red land than on the white sandy land but the bollweevil destroys a larger proportion of the crop, owing to the later fruiting of the plant on the clay loam soils. However, during fairly dry growing seasons, cotton yields on the clay loam soils almost equal those on the sandy loam soils.

Corn, oats, wheat, and hay have replaced cotton to a very large extent on these red soils. That part of the county lying between Greenwood and Ninety Six, and including land in the vicinity of Ninety Six, has for many years been known as the grain belt of the county. In fact the small grains are probably the main crops in this section. Clover, vetch, Lespedeza, and Johnson grass also do well.

The Cecil subsoils are high in content of potash, whereas the Davidson subsoils, although lower in potash, are high in lime and contain considerable manganese dioxide. As these soils are intimately associated and each possesses elements not common to the other, a favorable balance is obtained for the production of small grains, legumes, and grasses.

Cecil clay loam.—The surface soil of Cecil clay loam, to a depth ranging from 5 to 8 inches, is light-red or red clay loam which in most places contains sufficient sand to render it friable and mellow. In

wooded areas the surface layer, to a depth of 1 or 2 inches, is brown sandy loam, but in some places the light-textured surface material has been washed away, leaving the red heavy clay exposed. The subsoil is light-red or deep-red heavy stiff but brittle clay extending to a depth ranging from 30 to more than 50 inches. It is underlain by lighter-red or reddish-yellow friable clay containing a noticeable amount of small scales of mica. At a depth ranging from 36 to 72 inches a soft mass of white, yellow, and brown partly decomposed rock material is present.

East and southwest of Ninety Six are areas of Cecil clay loam which have a dark-red color somewhat similar to that of Davidson clay loam. The soil in these areas has been derived from a rock differing slightly from the ordinary granite or gneiss, that is, the rock contains a rather large quantity of dark-colored minerals, and the weathering of these has imparted the dark-red color to Cecil clay loam. The surface relief of these areas is not quite so broken as that of the typical soil, and the land is slightly more productive than typical Cecil clay loam. Alfalfa and other grass crops do well.

Throughout the areas of Cecil clay loam are small bodies which have a sandy loam surface layer 2 or 3 inches thick. The presence of this layer may be explained in two ways as follows: (1) It has not been entirely eroded or washed away, or (2) it occurs on the lower parts or at the bases of slopes as the result of water or wind action, probably the former.

Another variation from typical Cecil clay loam occurs largely in the section between Greenwood and Ninety Six, where a typical condition of soil accumulation has evidently taken place at the heads of small indistinct drainage ways or in slight depressions. The surface soil is variable in texture and may be sandy loam, sandy clay loam, or loam. In color it is grayish brown or yellowish brown. In most places the subsoil is yellow, mottled or spotted with red, gray, and brown, silty clay or heavy clay. Such areas are devoted to pasture, are used in the production of corn, or support a growth of brambles and briars.

The total area of Cecil clay loam is 93.7 square miles, and approximately 40 percent of the land is used for agriculture. About 40 percent of the cultivated land is devoted to cotton, 24 percent to corn, 20 percent to oats, 12 percent to wheat, and 4 percent to hay other than that made from oats, or vetch and oats. Cotton yields from one fourth to one half bale an acre, and oats from 20 to 30 bushels, if threshed for grain, but most of the oats are cut green for hay. Corn yields from 15 to 25 bushels an acre and wheat from 8 to 12 bushels. Vetch and oats are commonly sown together for hay, and they yield from 1 to 1½ tons an acre. Soybeans yield practically the same amount of hay as vetch and oats grown together. Soybeans, Lespedeza, Austrian peas, and alfalfa give excellent returns on this soil.

Alfalfa requires an acre application of about 2 tons of ground limestone and also some manure and fertilizer to render the soil suitable for its production. Cotton land receives from 200 to 400 pounds an acre of a 4:12:4 or 4:10:4 fertilizer, and some farmers make a side dressing ranging from 75 to 100 pounds an acre of nitrate of soda. Other farmers fertilize with 300 pounds of superphosphate (acid phosphate) an acre and make a side application of about 100 pounds an

acre of nitrate of soda. It is not customary to fertilize oats at the time of planting, but in the spring they receive a top dressing ranging from 75 to 100 pounds an acre of nitrate of soda. Other farmers sow oats with an application of about 200 pounds of superphosphate and in the spring add from 75 to 100 pounds of nitrate of soda as a side dressing. Wheat is fertilized in much the same manner and with similar quantities of fertilizer as are oats.

Cecil clay loam, broken phase.—The broken phase of Cecil clay loam represents entirely a soil condition which has been brought about by excessive surface washing and erosion. The eroded areas occur on rolling, broken, and hilly relief. Constant washing of the surface soil, which in most places is destitute of vegetation during the winter, has resulted in the cutting of deep V-shaped gullies between inverted V-shaped ridges. In places where the surface soil and subsoil still remain, they are very similar in color, structure, and texture to the corresponding layers of typical Cecil clay loam. The soil which at one time constituted the surface layers of Cecil clay loam or Cecil sandy loam has been washed away almost entirely in the eroded areas, and it is not an uncommon condition to find that the former subsoil layers have been eroded and the partly decomposed underlying rock formations are exposed. Much of the surface soil and subsurface soil thus removed has been deposited on nearby bottom lands, but a large part has been carried to adjoining counties, to adjoining States, or to the sea.

This is a nonagricultural soil, so far as cultivated crops are concerned. A very small percentage of the land is used for pasture, but it supports a very scant grass growth. The one practical use for such a soil condition is to allow the land to reforest itself. To some extent pine, post oak, white oak, and blackjack oak are springing up as second growth. This deplorable state of soil destruction might have been checked in the very beginning by proper care in terracing and by proper usage of the land. Even at this advanced state of erosion, if young forest trees were planted thickly, the large channels dammed with earth and stone, and as soon as possible a stand of some hardy grass or legume encouraged, the broken lands might be recovered and at the same time be affording pasture and a crop of timber.

Davidson clay loam.—Davidson clay loam is locally known as "push land", "gummy land", or "red heavy clay land", and it differs from Cecil clay loam in having a firm but friable brownish-red or reddish-brown rather heavy clay loam surface soil 6 or 8 inches thick. The subsoil extends to a depth ranging from 36 to 48 inches and consists of dark-red or maroon firm smooth brittle clay which is almost free from grit or sand particles. It readily breaks into small fragments which are easily crushed. Underlying the subsoil is a reddish-yellow soft mass of partly disintegrated basic rock material. In a few places stones occur on the surface but not in sufficient quantity to be indicated on the soil map. In places the surface soil is brown or reddish-brown loam and locally the subsoil is light-red clay which is not quite so brittle as the typical subsoil. Such areas approach Mecklenburg loam in their characteristics.

The largest developments of this soil are in the vicinity of Ninety Six, near Verdery, and in a belt extending in an east-west direction about midway between Greenwood and Hodges. About 50 percent of the land is cultivated, 30 percent of which is planted to cotton, 25

percent to corn, 20 percent to oats, 15 percent to wheat, and 10 percent to hay and legume hay. Crop yields and fertilizer treatments are very similar to those for Cecil clay loam. The soil is well adapted to the production of small grains, clover, and alfalfa.

Near Rock Hill, S C, this soil is used for the production of alfalfa. It is one of the best, if not the best, grain and clover soils in the State. It contains a greater amount of lime in the subsoil than any other soil in the county, which explains its adaptability to the growth of legumes. The greater part of the so-called grain belt of Greenwood County is composed largely of Davidson clay loam occurring in close association with Cecil clay loam. Davidson clay loam has great potential value.

Davidson clay loam, broken phase.—The broken phase of Davidson clay loam is not extensive. It is very similar to the broken phase of Cecil clay loam in every respect, except that the color of the scant remaining surface layer is reddish-brown and that, as a rule, the ravages of water action leave U-shaped gullies between inverted U-shaped ridges, in contrast to the V-shaped gullies and ridges on the Cecil soil. In its present condition the land is nonagricultural, but it may be reclaimed in the same manner as land of the broken phase of Cecil clay loam.

SOILS WITH GRAY OR BROWN LOAM SURFACE SOILS

This group of soils includes Iredell loam, Mecklenburg loam, Mecklenburg loam, broken phase, meadow (Congaree material), and Wickham fine sandy loam. The total area of these soils is 72 3 square miles. The main occurrences of the Iredell and Mecklenburg soils is very similar to those of the Davidson soils of the red-land group. Meadow and the Wickham soils occur as first-bottom land and as terrace, or bench land, respectively, along the streams.

The surface relief of these soils is nearly level, sloping, undulating, or rolling. The areas of Wickham fine sandy loam and meadow (Congaree material) are nearly level or gently undulating, and the areas of Iredell loam and Mecklenburg loam are undulating or rolling. For the most part these two soils have good natural surface drainage, but small areas of Iredell loam are poorly drained in the surface soil, and internal drainage is also poor, owing mainly to the heavy waxy character of the subsoils. Wickham fine sandy loam has good surface and internal drainage, whereas meadow (Congaree material) has poor or very poor surface and subsoil drainage, owing to the nearly level relief and to the fact that in many places the lower part of the subsoil is little, if at all, above the level of the stream channel.

The surface soils of this group range from loam or fine sandy loam to silt loam or silty clay loam in texture and from brown to grayish brown in color. The subsoils range from dark-red through yellowish-brown to greenish-yellow heavy waxy plastic clays in Iredell loam and Mecklenburg loam, whereas the subsoils of Wickham fine sandy loam and of meadow are reddish-brown or grayish-brown sandy clays or silty clays. One striking characteristic of the soils of this group is the variety of positions occupied by the different soils. Iredell loam and Mecklenburg loam are upland soils, Wickham fine sandy loam is a terrace soil, and meadow (Congaree material) is a bottom-land soil.

Although the soils of this group occupy nearly one seventh of the land area of the county, a very small percentage of their area is under

cultivation They are the soils least tilled under the present system of agriculture. Perhaps from 15 to 20 percent of their area is cultivated, and the remainder is in pasture or is in the course of being reforested. Corn, oats, and hay are the principal crops. Cotton is grown to a very small extent, and its yield depends largely on the season—whether it be rainy or excessively dry. Corn, oats, and hay yield fairly well unless the season is exceptionally dry, when the crops suffer from drought. In wet seasons the surface soil becomes soggy, and sometimes crops are a total failure. All the soils of this group are acid.

Iredell loam.—Iredell loam, commonly known as “blackjack land”, “pipe-clay land”, or “buckshot land”, has a dark-gray or grayish-brown loam surface soil 6 or 8 inches thick. Strewn over the surface in many places is a noticeable quantity of brown small rounded concretions of iron or manganese. The subsoil is brownish-yellow heavy soft plastic clay with a green cast, which passes into soft green-tinted rotten rock material at a depth ranging from 20 to 32 inches. The subsoil when exposed to the air dries slowly, shrinks and cracks extensively, and turns a rust-brown color. It is moderately acid or slightly alkaline in the lower part. In a few places gravel occurs over the surface soil in sufficient quantities to warrant indication on the soil map by symbol. In some small areas the texture of the surface soil approaches sandy loam, and in other places it is very nearly clay loam, but generally the surface layer of Iredell loam as it occurs in this county contains a fair quantity of sandy and fine gravelly material.

This is not an extensive soil in Greenwood County. The largest development occurs south of Epworth. The other areas are small and are closely associated with Davidson clay loam of the red-land group.

Perhaps one fourth of the area of this soil is in cultivation to corn, oats, and hay, which are the chief and most successful crops on this land. Cotton is very uncertain, as it has a tendency to rust, and perhaps less than one sixth of the tilled soil is devoted to this crop. Corn, oats, and hay occupy about equal acreages. Cotton yields from one fourth to one third bale an acre, corn from 15 to 20 bushels, and oats and hay give fairly good yields in favorable years. Fertilizers are not used extensively, owing to the uncertainty of a crop. Kainit is used by some farmers as a form of potash fertilizer to reduce rust on cotton and the “frenching” of corn. Some areas of this land are used for pasture. At one time or another much of the Iredell loam has been cleared and farmed, but at present the greater part of it is lying idle and is gradually reforesting to pine, post oak, blackjack oak, scrub oak, dogwood, and locust. A heavy growth of brush and briars is springing up. In some places in the State, Iredell loam has been seeded and excellent pasture obtained. Its best use is for pasture or the production of grain.

Mecklenburg loam.—The 3- to 6-inch surface layer of Mecklenburg loam is mellow and friable brown loam. The subsoil, to a depth ranging from 15 to 24 inches, is light-red or light brownish-red heavy tough waxy clay underlain by greenish-brown or greenish-yellow heavy tough plastic clay that grades into a green-tinted soft mass of rotten rock material. The surface soil is moderately acid, the subsurface soil slightly acid, and the subsoil mildly alkaline.

Throughout its extent in Greenwood County, the surface soil of Mecklenburg loam is variable in texture. In some places the texture is sandy loam, in other places clay loam, and in others fine sandy loam, but in all places the material contains much coarse sand or fine gravel. The proportions of silt and fine sand are sufficient to class the soil as a loam.

The occurrence of this soil is similar to that of Iredell loam. Owing to the more rolling relief, this soil has better surface drainage than Iredell loam, and for this reason more of it is used for cotton. Corn, oats, and hay are also grown. The yields of cotton range from one third to two fifths bale an acre when from 300 to 400 pounds of a 4:10:4 or a 4:10:2 fertilizer are applied. Corn yields from 15 to 20 bushels with a side dressing ranging from 75 to 100 pounds an acre of nitrate of soda. Oats are given an acre application of about 200 pounds of superphosphate at time of sowing, and in the spring they receive from 75 to 100 pounds of nitrate of soda. They yield from 20 to 25 bushels an acre, if threshed for grain, and good yields of hay, if they are cut in the dough stage. Vetch and oats grown together and cowpeas sown alone are also harvested for hay, with yields of $1\frac{1}{2}$ or 2 tons an acre.

About one third of Mecklenburg loam is used for tilled crops, cotton occupying perhaps one third of the cultivated land, corn one fifth, oats one fourth, and hay the remainder. The uncultivated land is in pasture or is supporting a growth of young pine, a few cedars, and oaks.

Mecklenburg loam, broken phase.—The broken phase of Mecklenburg loam is very similar to the typical soil in every respect, except that it has been badly gullied and eroded. It is comparable to Davidson clay loam, broken phase, in extent, in appearance, and in use. Its best use is for forestry and pasture.

Wickham fine sandy loam.—Wickham fine sandy loam has a light-brown mellow and friable surface soil from 6 to 10 inches thick. The subsoil is somewhat stiff but brittle reddish-brown sandy clay or friable clay to a depth of about 32 inches, below which depth is reddish-yellow friable crumbly clay or sandy clay. This soil is an old alluvial soil which has developed on terraces or second bottoms lying from 20 to 40 feet above normal overflow waters. The land slopes gently toward the streams, insuring good drainage.

Included with Wickham fine sandy loam as mapped are a few areas of soil which has a gray or grayish-yellow mellow friable fine sandy loam surface layer ranging from 5 to 9 inches in thickness. This layer is underlain by a 6-inch layer of yellow or brownish-yellow friable crumbly fine sandy clay. The subsoil from a depth of 15 inches to a depth of 30 inches is mottled ochereous-yellow and light-gray friable and crumbly fine sandy clay or silty clay. Such areas would have been mapped Altavista fine sandy loam had they occurred in larger bodies.

Although of small extent, Wickham fine sandy loam and its variations constitute a valuable farming soil, and nearly all the land is under cultivation. Cotton yields from one half to 1 bale an acre, corn from 20 to 25 bushels, and oats from 25 to 30 bushels. The methods of planting, of handling the crops, and the fertilizer treatments are all very similar to those used on the upland soils.

Meadow (Congaree material).—Meadow (Congaree material) is an alluvial soil which occurs in the first bottoms along the streams. The areas range in width from 100 feet to more than one fourth mile. The deposited soil materials are variable in color, texture, and structure and on account of their variability cannot be classified as definite soil types. Meadow is made up largely of Congaree soil material which has not as yet developed into a definite soil, on account of poor drainage conditions and the constant deposition or removal of material. During each overflow new material is added, and occasionally material of former deposits is removed. In many places this soil is saturated during a part of the year and is subjected to frequent inundations.

Very little attempt is made to cultivate this land, on account of the hazard of flooding. When corn is planted and is not destroyed by overflows, it yields from 30 to 50 bushels an acre without the aid of commercial fertilizers or manures. Meadow occupies 36 7 square miles in Greenwood County. Perhaps 10 percent of it is used for summer pasture land, and the remainder is allowed to lie idle and is being reforested to pine, sweetgum, birch, willow, a few ash, elm, sycamore, and alder. Briers and wild cane form the undergrowth. Where grasses are able to obtain a stand, they afford good pasture on account of the abundance of moisture in the soil and because of the fertility. The deepening and straightening of the present natural stream channels and the construction of ditches along the upland edges of the bottoms to intercept run-off from the upland slopes would in some places almost solve the problem of reclamation of this soil. If reclaimed it would make excellent small-grain and pasture land. At one time these first bottoms comprised the most fertile and productive land in the county. The washing in of sand and consequent poor drainage has ruined the land for general farming.

SOILS WITH GRAY OR PALE-RED SILT LOAM SURFACE SOILS

This group comprises the silt loam and silty clay loam members of the Georgeville series, Alamance silt loam, and Orange silt loam. All these soils have been formed by the weathering and decomposition of the Carolina slate formation. The surface soils of the soils of this group are dominantly light-gray or pale-red silt loams or silty clay loams. The subsoils range from pale-red clay or silty clay in Georgeville silt loam and Georgeville silty clay loam to grayish-yellow or whitish-gray floury silt loam in Alamance silt loam and Orange silt loam. The surface layers and subsoil layers of all these soils range from moderately to highly acid. The soil material has a smooth floury feel, owing to the high silt content, and the organic-matter content is deficient in the surface layers. The high content of silt and the lack of organic matter in these soils are contributing factors to their tendency toward puddling or running together when wet by normal or excessive rainfall. These conditions further tend toward the formation of clods and a crust layer on the surface when the sun and air dry the surface soil and cause the soils to be late in drying out and warming up in the spring. They are termed "late" soils. White angular quartz, brown smooth rounded gravel, and broken platy pieces of slate are commonly more or less unevenly scattered over the surface of parts of all the areas of these soils.

The total extent of these soils is 73 square miles, and they are confined to a large body, which occupies one seventh of the entire area, in the southeastern part of the county. The surface relief is nearly level, undulating, or rolling, and in only a few places is the land eroded or broken. Natural drainage is good, except in the Orange soil and in a few places in the flatter areas of the Alamance soil. Orange silt loam is poorly drained, partly because of its nearly level relief, but largely owing to the highly plastic impervious character of the subsoil.

Although the soils of this group occupy an area almost equal in total extent to that of the gray or brown loam group, a much larger percentage, probably about 35 percent, of the land is used for cultivated crops. The untilled parts of the Georgeville and Alamance soils, as well as all the Orange soil, are reforesting to pine of a short-leaf variety, post oak, scrub oak, hickory, and dogwood. Brambles and briars are abundant. These late soils are used to less extent for cotton than the more sandy soils and to a greater extent for corn, oats, wheat, rye, oats-and-vetch hay, and pea-vine hay. To the advent of the bollweevil, which has made the growing of cotton on such late soils unprofitable, and to less extent to the inaccessibility of this part of the county during wet weather, may be attributed the abandonment of farms in this locality.

Georgeville silt loam.—Georgeville silt loam may be considered the representative, or the normally developed, soil formed from slates. The surface soil to a depth of 6 or 8 inches is grayish-brown or light grayish-yellow smooth mellow silt loam. Owing to the difference in thickness of this silt loam layer, the color of plowed fields is variable and spotted. Where the subsurface or subsoil has been turned up by deep plowing, a light-yellow or reddish-yellow cast is present. The subsoil is red or light-red brittle friable smooth silty clay to a depth ranging from 60 to 70 inches. Below this is soft decayed slate rock tinged with red, purple, and yellow. The surface soil of this soil contains more or less gravel which are more numerous on the knolls than on the more nearly level areas. In places the silt loam surface soil has been removed by erosion, thereby exposing the light-red silt loam or silty clay loam.

The total area of this soil is 17 1 square miles, of which, perhaps, 60 percent is cultivated. The principal crops are cotton, corn, oats, and hay, grown on about equal acreages. Cotton yields range from one fourth to one half bale an acre, corn from 10 to 20 bushels, and oats from 15 to 20 bushels. Yields of wheat average 10 bushels an acre; of rye, 20 bushels; and of oats-and-vetch hay, 1½ tons.

Cotton land receives an acre application ranging from 100 to 200 pounds of 4 : 10 · 4 commercial fertilizer. Corn receives from 100 to 150 pounds of the same fertilizer, and some farmers make a side application of 75 pounds of nitrate of soda at the time of the last cultivation. Oats and wheat receive about 200 pounds of 3 : 8 : 3 commercial fertilizer at time of sowing, and in the spring 100 pounds of nitrate of soda is added. Oats, vetch-and-oats hay, and pea-vine hay are fairly important crops and are being recognized by some farmers as soil improvers.

Georgeville silty clay loam.—The surface soil of Georgeville silty clay loam is reddish-brown, pale-red, or yellowish-red silty clay loam from 4 to 6 inches thick. The subsoil is red or almost maroon silty clay which is slightly heavier than the subsoil material of Georgeville

silt loam. It ranges in depth from 40 to 80 inches and grades into soft partly decomposed slate rock tinted with red, purple, and yellow.

This soil occupies a larger area than Georgeville silt loam. It is not so extensively cultivated as the silt loam, probably on account of its tendency to clod and its slower rate of drying. Cotton, corn, oats, and some wheat are produced, in addition to oats-and-vetch and soybean hay. Crop yields and fertilizer treatments are practically the same as on Georgeville silt loam. The soil is not quite so easy to till as the silt loam, but it is considered a slightly stronger soil for the production of small grains and grasses.

Alamance silt loam.—The surface soil of Alamance silt loam is light-gray or yellowish-gray smooth floury silt loam 6 or 8 inches thick. A few quartz fragments occur in this layer. When dry, the surface material is almost white. The subsoil begins as light-yellow heavy silt loam and quickly passes into silty clay loam which extends to a depth ranging from 20 to 30 inches. A mottled light-gray, white, and yellow silty clay or soft decomposed slate rock underlies the subsoil.

A shallow phase of Alamance silt loam occurs throughout the silt loam areas, in which the light-colored slate rock is reached at a depth ranging from 12 to 15 inches. Such spots are small and of little agricultural importance.

Less than 10 percent of the land is used for cultivated crops. Very little cotton is grown on this poor and generally late soil, and the yields are low, ranging from one fifth to one third bale an acre. Corn and oats-and-vetch hay are the chief crops. Corn yields from 10 to 12 bushels an acre and as a rule receives only nitrate of soda at a rate ranging from 75 to 100 pounds an acre, or from 200 to 300 pounds of superphosphate without the later addition of nitrate of soda. Hay yields range from 1 to 1½ tons an acre. This soil is being abandoned and is reverting to forest.

Orange silt loam.—Orange silt loam resembles Alamance silt loam in the surface layer which extends to a depth ranging from 4 to 10 inches. The subsoil is whitish-gray, mottled with brown and yellow, heavy very plastic clay to a depth of 20 or 24 inches. The material in the subsoil is very variable and in many places, between depths of 8 and 14 inches, it may be a marbled light-gray and red silt loam, and, between depths of 14 and 24 inches, it may be mottled drab, red, and reddish-brown highly plastic heavy clay. It grades into light-colored soft rock. In many places particles of this rock are on the surface, the rock outcrops locally, or the surface soil rests directly on the rock.

Probably only 1 percent of this soil is farmed, and some of it is used for pasture land. The white or light-gray surface soil contains only a small amount of plant food, and this feature, in addition to the heavy impervious subsoil, which affords poor drainage, tends to make it a soil of low agricultural value. Some of the land is reverting to forest cover of pine, scrub oak, blackjack oak, and dogwood. Vines, briars, wild onions, and wild grasses abound. On account of its undesirable qualities, this soil has never been extensively developed.

AGRICULTURAL METHODS AND MANAGEMENT

As the soils of Greenwood County developed under forest, they never contained a large quantity of organic matter. In fact, after a few years of clean cultivation, the small amount of organic matter in

the upper 2 or 3 inches of soil, or the thin layer of organic matter on the surface, gradually disappears. Cotton, the chief crop, receives clean cultivation, and, as very little organic matter has been added, the greater part of the soils of the county are deficient in humus, which is indicated by their light color. Some of the better farmers, who have grown and turned under leguminous crops, have added organic matter to the soils and have greatly increased their productive capacity. This method could be extended to practically all areas of the county, and the soils would be greatly improved.

No definite system of crop rotation is practiced by the majority of the farmers. A good crop rotation is recognized as an essential part of a good farming system, and every farmer should adopt a plan of rotation suitable to the soils on his farm and to the crops which he desires to grow. Perhaps one of the best rotations for this general region is the following: First year, corn with cowpeas or velvetbeans; second year, oats and the land seeded to cowpeas or velvetbeans after the oats are harvested; and third year, cotton followed by winter peas, vetch, or rye. On many farms it may be necessary to plant cotton 2 years in succession.

By planting and plowing under winter cover crops the soils are protected from much leaching and erosion during the winter, and the organic matter thus added enables the soil to absorb more of the rainfall and makes it more retentive of moisture. Soils which have been plowed deeply are less subject to washing and erosion than soils which are plowed to only a slight depth or merely scratched on the surface.

It is estimated that about 12 percent of the land of Greenwood County has been practically destroyed for agricultural operations by severe washing and gullying. Erosion is rapidly progressing, and, unless checked, it will lay waste many more acres of valuable farming land. Some of the farmers have terraced their lands, even on the gentle slopes, and have thereby greatly improved the conditions of the fields. Much of this eroded land can be reclaimed by building dams of rock and brush across the gullies at short intervals and by covering the surfaces of eroded places with manure and seeding such areas, as soon as possible, to cowpeas or soybeans to be turned under. By good management, many of these unsightly places on the farm could be converted into productive fields within a few years.

Practically all the soils of Greenwood County range from slightly acid to acid. Lime has never been used to a great extent on these soils. According to the Clemson Agricultural College of South Carolina, Extension Service Circular 70, entitled "Winter Cover Crops", the data obtained and compiled would indicate that liming in this State for general farm crops as a whole is unprofitable unless a definite rotation is practiced. Where a rotation is practiced, about 1 ton of ground limestone an acre applied at intervals ranging from 3 to 5 years is advisable, and some evidence of improvement is shown in the soil. The Georgia Experiment Station has proved that liming of soil is profitable where a 3-year rotation is practiced. The crops in this rotation consist of corn, cotton, oats, and hay. The farmers of Greenwood County, who have grown crimson clover or alfalfa, have learned that an acre application of 1 or 2 tons of lime is necessary.

Commercial fertilizers have been used in abundance for many years. Until a few years ago the fertilizer generally used on cotton was a 3.8:3 mixture, but of late years a 4:10:4 or 4:10:2 mixture is being

used at a rate of application ranging from 300 to 600 pounds an acre. In addition to applying the fertilizer at the time of planting the crop, an additional 75 or 100 pounds of nitrate of soda is applied as a top dressing at chopping time. Clemson Agricultural College Extension Service Bulletin 86, entitled "Cotton Fertilizers", reports that a 500-pound application of 4:10:4 or a 600-pound application of 4:10:2 fertilizer, followed by a side dressing of 100 pounds of nitrate of soda at chopping time, has been profitable.

Only a few farmers have practiced dusting to combat the cotton bollweevil. Early planting and measures to promote early fruiting are the chief methods resorted to in avoiding too great a loss from this pest. The farmers as a rule do not attempt to dispose of the cotton stalks as soon as possible after the last picking or to rid waste places, deep banks, terraces, or adjacent cotton fields of briars and brush, which serve as winter quarters for the weevil.

The South Carolina Agricultural Experiment Station recommends the following varieties of cotton for the soils of Greenwood County: Humco-Cleveland or Wannamaker-Cleveland as a short-staple variety for wilt-free land, and Dixie Triumph for wilt-infested soil. Lightning Express, Delta-type Webber, or Carolina Foster are some of the long-staple varieties recommended.

At the time the soil survey was made, the corn produced in Greenwood County was not sufficient to supply local needs. The best farmers consider it bad policy to buy corn and hay to feed the work animals when these products can be grown at home. Especially is this true when cotton is selling at extremely low prices.

SOILS AND THEIR INTERPRETATION

Greenwood County is in the northwestern part of South Carolina in the middle of the piedmont-plateau region. The soils are lateritic and belong to the red-soil group of the United States. Prior to occupation by man, the upland soils of the county supported mainly deciduous trees, including numerous varieties of oak and hickory, together with some shortleaf pine. The soils were, therefore, developed under forest cover which was not conducive to the accumulation of a large amount of organic matter, as in the prairie soils. The virgin soils contain a small amount of organic matter in the topmost 1 to 3 inches, and in a few places a very thin layer of leaf mold is on the surface, but this small amount of organic matter is rapidly disseminated through cultivation. The warm temperature and heavy rainfall have further acted toward a complete washing out and oxidation of the organic matter.

The soils of Greenwood County are light colored, that is, they range from light gray to red in the surface layers. Leaching of the soluble elements and alkaline earths is continuous throughout the greater part of the year, as the ground is seldom frozen, except to a slight depth for a short period. No accumulation of carbonate of lime occurs in the solum, although some of the rocks from which the soils are derived contain considerable calcium. The soils range from slightly acid to strongly acid in the A horizon, and the B horizon is still more acid, except in Mecklenburg loam. Applying sandy loam throughout its profile is the most acid soil, and Mecklenburg loam is almost neutral in reaction.

Since the forest growth was removed and cultivation began, erosion has been active, not only on the steeper slopes but even on the undulating or gently rolling areas. All the county, except a few flat upland areas and the first bottoms, has undulating or gently rolling to rolling and hilly relief, and the land is naturally well drained. On these hillsides gullying and erosion have devastated many areas of once-productive soils. Erosion has not only laid waste many areas of land, but it has destroyed the one-time normal soil profile of large areas. It has changed the texture of the surface soils in a large part of the county and is responsible for the translocation of materials from the higher-lying to the lower-lying positions. The finer materials of much of the sandy loam and clay loam soils have been carried away by surface water and by the lateral movement of rain water through the soil.

Climatic conditions, that is, temperature and rainfall, are uniform over Greenwood County, so that soil differences due to climatic differences do not exist. The differences, therefore, in the soils are owing to the underlying rock formations and the action of forces of weathering. The soils of the county have been formed in situ from the underlying rock formations, and they bear a direct relationship to the parent material as is revealed in the solum.

Three distinct groups of rocks or geological formations occur in the county, and the rocks in these groups differ in chemical and physical properties. In some places the same kinds of rocks give rise to soils which differ in their characteristics, owing to drainage, aeration, and oxidation.

The first group includes granite, gneiss, fine-grained schist, and a small quantity of somewhat basic gneiss which contains a large percentage of dark-colored minerals. These rocks underlie the greater part of the county and give rise to the Cecil, Appling, Durham, and Worsham soils. The rocks are high in potash, and the B horizons of the soils contain a moderate percentage of this element. The fine-grained schist giving rise to Cecil fine sandy loam borders the slate belt.

The second group of rocks comprises the diorites, quartz diorite, and gabbros, known as the dark-colored basic rocks. The diorites are locally called niggerhead rocks. Weathering of these rocks has produced the Davidson, Mecklenburg, and Iredell soils. These soils differ widely in color, texture, and consistence, depending on the age or state of development of the profile. Of these soils, the Iredell is evidently the youngest in soil-profile development. Its B horizon is light colored, extremely plastic, and in few places is it more than 24 inches thick. Poor drainage may account for the youthful profile. The Davidson is probably the oldest or most mature soil of the group. It shows complete oxidation of the iron and has a thick uniformly colored B horizon. Intermediate in color and consistence between the Iredell and Davidson soils is the Mecklenburg. This group of soils contains more lime, especially in the B horizon, than the soils of the first group, and, in addition, the Davidson contains a rather large quantity of manganese.

Another important group of rocks is the Carolina slates which occur in an almost unbroken belt in the southeastern and southern parts of the county. These slate rocks are fine grained and on weathering give rise to extremely silty or flourlike soils which are classed in the

Georgeville and Alamance series. Occurring in these slates are intrusions of a green-tinted rock, apparently of volcanic origin, which may be classed as dacite or epidote. Such rocks have weathered differently from the slates, and they give rise to the Orange soils.

Small angular quartz gravel and larger quartz fragments occur here and there throughout the county. In the slate belt a small quantity of fine platy fragments of slate or concretionlike particles occur in places on the surface. In a few places granite boulders or extensions of the solid rock appear on the surface or occur at a slight depth below the surface.

Only a small percentage of the land in Greenwood County is sufficiently smooth to allow the development of a normal soil profile. Two groups of soils occur—those which have well-developed or partly developed soil profiles and those which have not developed normal soil profiles. In the first group, some of the soils of the Cecil, Appling, Durham, Davidson, and Georgeville series have the most mature profiles in the county.

The normally developed soils have an eluviated A horizon and an illuviated B horizon. The B horizon ranges in thickness from 2 to more than 6 feet, and the material is uniform in color, whether it be red or yellow. The subsoil is the seat of the greatest amount of plant food, the reservoir for soil moisture, and it is also highly retentive of fertilizers and manures. The C horizon is exceedingly variable in color, structure, and other characteristics. In the B horizon of the normally developed or comparatively mature soils, as the Cecil, Davidson, and Georgeville, the iron has been oxidized to the ferric state. In the Durham, Appling, Iredell, Worsham, and Alamance soils, the iron is not so well oxidized, owing to poor drainage and aeration, or, as in the Durham soils, if it were ever red in the B horizon, the red color has been lost through dehydration. The water table in the Durham, part of the Appling, and Worsham soils is much nearer the surface than in the Cecil soils.

Cecil sandy loam may be considered the normally well developed or mature soil of the county. A description of a profile of this soil, 1½ miles northwest of Blakedale, follows:

- A₁ 0 to 6 inches, light-brown light sandy loam which is friable and mellow.
- A-B 6 to 9 inches, light-orange or reddish-yellow sandy loam or heavy sandy loam. This is an intergrade layer between the A₁ and B₁ horizons, consisting of sandy loam in the upper part and of sandy clay in the lower part.
- B₁ 9 to 48 inches, red stiff but brittle clay which breaks into irregular-shaped lumps or fragments that are uniform in color, that is, the insides of the particles or soil aggregates are the same color as the outsides or along the cleavage planes. A cut or crushed surface of this clay is reddish yellow. The material contains some sharp angular quartz sand and a small quantity of finely divided mica scales.
- B₂ 48 to 60 inches, yellowish-red clay which is friable and contains some sand and more mica scales than the layer above. Spots of soft yellow more sandy material occur in the mass. The yellow spots or blotchings increase in number with depth.
- C₁ 60+ inches, disintegrated granite rock which, as a whole, is whitish gray or light gray, with mottles or mingling of yellow or brown, and contains a moderate quantity of black specks, constituent minerals of the granite.

Cecil sandy loam, mixed phase, Cecil fine sandy loam, and Cecil clay loam differ essentially from the sandy loam in the texture and consistence of the A horizons. Cecil clay loam, broken phase, is largely the result of erosion, as part of the A horizon has been removed.

Durham coarse sandy loam is the only member of the Durham series in Greenwood County. The light-textured A horizon is light gray or grayish yellow. The B horizon is moderately brittle and friable distinctly yellow clay. The C material generally contains less red and, in most places the solum is shallower than that of Cecil sandy loam.

The Appling soils are intermediate in color profile, development, and consistence between the Cecil soils, with their red B horizons, and the Durham soils with their yellow B horizons.

A profile description of Davidson clay loam, as observed 2 miles southeast of Hodges, shows the following horizons.

- A₁. 0 to 1 inch, dark-brown loam containing a fair quantity of organic matter and having some leaf mold on the surface
- A₂. 1 to 8 inches, moderately friable and crumbly dark reddish-brown clay.
- B₁. 8 to 40 inches, dark-red or maroon heavy smooth clay which is rather stiff and brittle. The material breaks into angular blocky fragments which are readily crushed between the fingers. It is smooth and differs from the B horizon of the Cecil soils in the small content of quartz sand. It contains a few black specks or very small rounded accretions high in manganese. A cut surface shows a light-red or yellowish-red color, and the color is uniform along breakage lines as well as in the interior of the soil particles or aggregates. In an exposed cut or bank, this material has a characteristic fluffy appearance, owing to the accumulation of fine granules, and in this respect it differs markedly from the material, which appears hard and bricklike, in the corresponding layer exposed in cuts of Cecil soils.
- B₂. 40 to 96 inches, light-red, blotched or mottled with ochereous yellow, friable smooth clay. The material in the lower part of this layer gradually becomes lighter in color and approaches ochereous yellow.
- C₁. 96 to 120 inches, friable and crumbly reddish-yellow or ochereous-colored partly disintegrated material.
- C₂. 120+ inches, yellow or ochereous-yellow disintegrated basic rock which is light in weight as compared to the heaviness of the fresh rock.

Georgeville silt loam may be considered the normally developed soil of the slate group. A profile of this soil, as observed one eighth mile north of Kirksey, shows the following layers:

- A₁. 0 to 3 inches, grayish-brown silt loam containing a small amount of organic matter.
- A₂. 3 to 7 inches, mellow, flourlike, and friable light grayish-yellow silt loam.
- B₁. 7 to 72 inches, light-red silty clay which breaks into small irregular fragments and can be easily crushed into small particles. A cut surface is reddish yellow. The material in this layer is hard and smooth but brittle and friable when moist, and it contains no coarse sand grains.
- C₁. 72+ inches, red, marbled with yellow, silt loam or silty clay loam, which is smooth and has a velvety tale feel. This is the structureless rotten parent rock material which in places shows evidence of its slate structure.

Georgeville silty clay loam is largely the product of erosion and represents areas in which the silt loam surface soil has been largely removed. In some places the material may show an advanced stage of soil development.

Alamance silt loam differs from Georgeville silt loam mainly in color profile. The B horizon of the Alamance soil is light-yellow silty clay loam, not quite so heavy as that of the Georgeville soil. It is developed on the flatter areas, and poor drainage and aeration have retarded oxidation. Orange silt loam differs from Alamance silt loam in having a heavy plastic clay B₂ horizon and in being more variable throughout.

Wilkes sandy loam is derived from aplitic granite or gneiss and is cut by dikes or intrusions of diorite or other basic rocks. There is no

uniformity in the horizons, and the soil represents a soil condition rather than a definite soil, in that it is badly gullied and eroded.

Worsham sandy loam has not developed a normal soil profile, because of poor drainage and lack of aeration, particularly in the subsoil. It owes its origin to the decomposition of granite or gneiss.

Wickham fine sandy loam is the only second-bottom, or terrace, soil in the county. The materials giving rise to this soil have lain undisturbed in a well-drained position for a sufficient length of time to develop an almost normal soil profile in places.

Meadow (Congaree material) occupies the first-bottom positions along the streams and is composed of alluvial sediments. The material is so recent in origin, so variable in texture and color, and so poorly drained that no uniform profile has developed.

In table 4 are shown the results of mechanical analyses of samples of representative soils in Greenwood County.

TABLE 4.—*Mechanical analyses of representative soil samples from Greenwood County, S C.*

Soil type and sample number	Depth	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
	<i>Inches</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>	<i>Pct</i>
Cecil sandy loam								
243830.....	0-6	16	8.8	17.0	34.8	17.8	12.2	7.7
243831.....	6-9	9	8.1	16.0	32.4	15.7	14.4	12.6
243832.....	9-18	4	3.8	7.5	14.0	6.8	9.0	58.6
243833.....	48-60	9	2.2	4.3	18.8	23.9	27.0	22.8
243834.....	60+	4.9	15.3	13.4	25.4	19.1	17.3	4.6
Appling sandy loam								
243820.....	0-4	2.9	12.8	10.8	21.4	18.5	21.9	11.6
243821.....	4-11	3.9	15.8	12.7	22.4	16.3	16.2	12.7
243822.....	11-14	3.1	14.4	11.5	19.6	14.1	16.2	21.1
243823.....	14-24	2.3	10.4	8.3	12.7	9.3	14.5	42.5
243824.....	24-40	2.1	12.6	5.9	8.1	7.2	17.0	47.0
243825.....	40-56	1.5	13.1	11.1	16.9	9.8	15.9	31.6
243826.....	56-80+	7	11.2	14.1	23.1	13.0	18.1	19.7
Durham coarse sandy loam								
243851.....	0-5	19.4	24.8	10.4	14.0	9.5	16.8	5.0
243852.....	5-20	25.6	24.5	10.3	12.0	8.0	14.6	5.0
243853.....	20-40	16.1	11.7	4.4	6.3	6.2	18.7	36.6
243854.....	40-56	8.8	8.0	2.8	5.3	6.0	17.8	51.2
243855.....	56-70+	11.0	8.3	3.6	7.3	7.5	20.6	41.7
Mecklenburg loam								
243835.....	0-3	.9	3.8	6.7	19.4	17.2	27.8	24.1
243836.....	3-15	.2	.5	9	3.1	3.7	14.0	77.5
243837.....	15-24	.1	2	7	6.4	11.0	17.7	63.9
243838.....	24+	1	3	3.2	17.2	20.8	27.3	31.0
Georgeville silt loam								
243801.....	0-3	3.4	5.9	5.6	10.8	11.4	52.5	10.5
243802.....	3-7	1.7	4.9	4.8	9.5	11.0	54.6	13.4
243803.....	7-72	5	1.4	1.2	2.4	3.6	32.6	58.4
243804.....	72+	3	.8	.8	1.4	2.9	56.0	37.9
Georgeville silty clay loam								
243805.....	0-1	1.0	1.9	1.7	4.5	6.3	53.5	31.1
243806.....	1-3	7	1.1	1.3	2.6	4.5	46.4	43.5
243807.....	3-30	2	3	1	.4	1.0	31.8	66.2
243808.....	30-60	1	3	.2	7	1.6	42.3	54.8
243809.....	60-84	.0	1	7	2.6	60.5	36.0	
243810.....	84-96+	0	.1	.2	1.2	3.2	71.4	23.8
Orange silt loam								
243811.....	0-4	1.3	1.9	1.3	3.2	5.7	69.4	17.2
243812.....	4-10	6	.9	.7	1.8	4.4	77.6	14.0
243813.....	10-24	.5	7	6	1.6	4.2	73.0	19.4
243814.....	24-42	4	3	3	.9	2.7	43.8	51.7

SUMMARY

Greenwood County comprises an area of 457 square miles in the northwestern part of South Carolina. It lies in the piedmont plateau region and has an undulating, rolling, and broken surface

relief. The greater part of the land lies favorably for agricultural operations. With the exception of small spots here and there, all the upland part of the county is naturally well drained.

The climate is mild and equable. The rainfall is ample and is well distributed throughout the growing season.

A comparatively large number of soils are in the county, owing to the various rock formations which underlie the area. The soils range from light-colored sandy soils through brown loams to red clay loams and to light-colored silty soils. The soils differ widely in their chemical and physical characteristics, and such characteristics are readily recognized by the farmers and landowners.

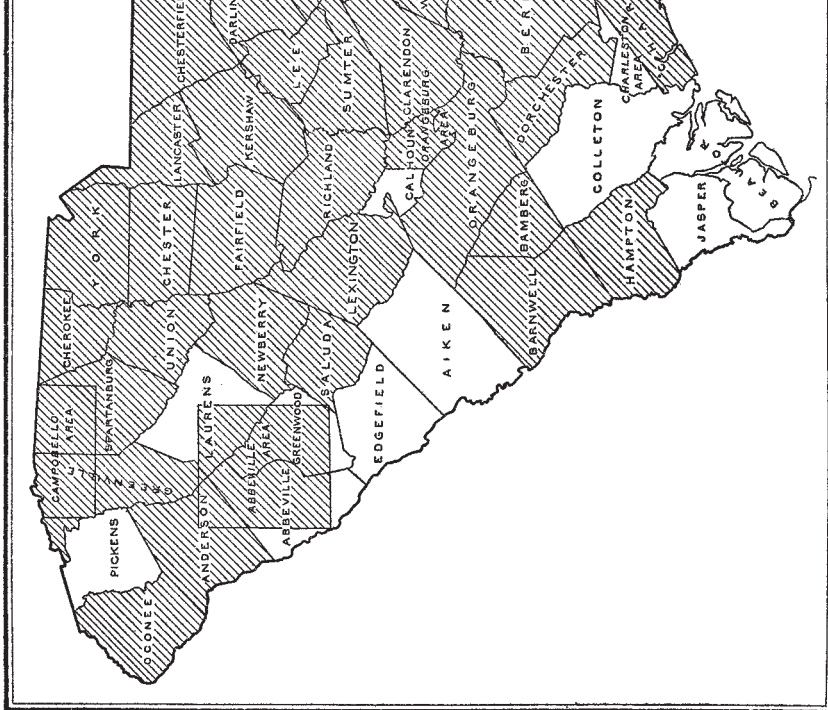
Owing to the wide range in soils, a large number of crops are well adapted to the soils and climate. Cotton has been for a long time, and still is, the main cash crop. In recent years, more corn, wheat, oats, cowpeas, clovers, rape, sweetpotatoes, and sorgho have been grown. Some of the more sandy soils in North Carolina, similar to those occurring here, are used for the production of bright tobacco. The dark-red clay loam, classed as Davidson, is, perhaps, the best alfalfa soil in the piedmont plateau.

Greenwood, the county seat, is a good market for the greater part of the farm products. Railroad transportation facilities and good surfaced roads are adequate. Land prices are low. Much of the land is of such quality that its productivity can be greatly improved. The county as a whole offers many advantages to home seekers.



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Areas surveyed in South Carolina, shown by s

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